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Barfield —

30 OCT 1961

Evaluation file


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TCS-10298-61-KH
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31 October 1961

MEMORANDUM FOR: General Jack E. Thomas, Commander, Air Force Intelligence Center, ACS/Intelligence

SUBJECT : Proposal for Evaluating T-KH Photography

1. Reference is made to your letter, subject as above, dated 18 October 1961.

2. We have studied subject reference in detail and have conferred with your representatives as well as with representatives of the other Services at NPIC. Detailed comments on this letter, resulting from our review and discussions, are attached as Inclosures 1 and 2.

3. I consider that, with certain modifications, the Type I (Area) QMCI will be suitable for use by the Intelligence Community to provide a general indication of the extent of KH coverage on both a qualitative and quantitative basis. In a qualitative sense it falls short of what I had hoped could be achieved; but I recognize the practical limitations of the problem and believe that it is the best we can do. I believe that NPIC should assist in the preparation of this type of report to make possible its preparation on a timely basis and to permit inputs from the entire Intelligence Community.

4. The modifications which I suggest are the following:

a. Change the qualitative definitions to those shown in Inclosure 2.

b. Provide statistics on percentage of cloud cover as explained in paragraph 2 of Inclosure 1.

I can appreciate that there may be problems in terminology and coding involved in these modifications, but I believe they can be easily resolved by

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further discussions between our representatives, which will be necessary in any case to establish working procedures.

5. If you concur in these modifications, I am prepared to assign joint teams at NPIC to the task of providing the frame by frame analysis of the photography following the procedures suggested by the Air Force proposal. I recognize that it may be some time before general statistical data covering the entire Soviet Bloc becomes available from the computer. Accordingly, as an interim measure, I am planning to prepare graphical coverage summaries using cloud cover data which we have previously prepared and photographic quality data based on a frame by frame analysis using the definitions in Inclosure 2. This also will be done by joint teams and the results thereof will be made available to you.

6. In summary I am suggesting that NPIC provide you with qualitative inputs for incorporation in an Air Force report to be disseminated to the Intelligence Community. I would appreciate an early reply as to whether or not you concur with the modifications I have suggested above and with the utilization of an NPIC input for the computer. Furthermore, assuming that we can provide the data to you as fast as you can utilize it, I would like some estimates as to time required to provide the QMCI's after each mission and the first summary of all missions.

ARTHUR C. LUNDAHL
Director

Inclosures
2 (As stated)

Distribution:
Cy 1 & 2 - Cdr., AF Intel Center, ACS/Intelligence
3 - C/TID/NPIC
4 - SIO/AF Det., NPIC
5 & 6- OD/NPIC

DD/NPIC: [redacted] (31 Oct 61) 50X1

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Inclosure I

## DETAILED COMMENTS ON AIR FORCE PROPOSAL

### Qualitative Mission Coverage Index - Type I
### (The Sino-Soviet Bloc)

1. The major shortcoming in the information that would be provided by this proposal involves the definition of photographic quality. The terms "excellent", "good", and "poor", as contained therein are defined too broadly and are from a processing point of view; they do not permit one to get any immediate appreciation of what might be seen on the photography. Any definitions of photographic quality must convey to the layman the best indication we can give ofthat types of targets he might be able to see and identify. While the types of targets in which we are interested will vary from time to time, certainly the definitions must be readily translatable, for example, into whether or not ICBM sites of the Yurya type would be identified. It is suggested, therefore, that the definitions given in the Air Force proposal be combined with more specific interpretable criteria. New proposed definitions are attached as Inclosure 2. These definitions are called category 1, 2, and 3 to permit the addition of new numbers when photography of a higher quality is received. Furthermore, instead of "poor, good, and excellent" it is suggested that we use "poor, fair, and good". This is really not too important except that using "good" for what amounts to average quality film may overrate the film in the analysts' minds. Furthermore, the term "excellent" does not leave room for adjectives to describe the better film which we will get next year.

2. The next most significant item is the fact that photography with clouds on it does not have either a quality rating or an indication of the percentage of cloud cover. It would be desirable to know the quality of the photography as seen between the clouds. However, as a practical matter it is probably difficult to evaluate photographic quality in areas of cloud cover and there are many uncertainties such as cloud shadow which affect its general suitability. Therefore itiis agreed that quality should not be recorded for cloud covered photographs. However, it is believed that an attempt should be made to record, in broad categories, the percentage of cloud cover. This would permit development of statistics which give a better appreciation of how much of an area has been "seen". For cloud cover purposes it is therefore recommended that category D be broken down into three parts: D1 (or whatever symbolization is desirable for machine purposes) would represent cloud cover

from 10 - 25%; D2 - from 26 - 50%, and D3 - from 51 - 99%. These categories were chosen to permit correlation of data already available from NPIC which was developed for weather reporting purposes. NPIC uses five categories of which the three just sited are in the middle. An additional category used at NPIC covers from 0 - 9% which it is assumed would apply to categories A, B, and C of the Air Force proposal (that is, these categories would have from 0 - 9% cloud cover). The final category used by NPIC is for 100% cloud cover which, of course, fits Air Force category F.

3. The entry for snow cover is of interest to NPIC, but it is suggested that it might have limited practical application. However, there is no objection to its inclusion.

4. Initially the 15-section breakdown of each frame proposed by the Air Force seemed to be an unnecessarily small breakdown, particularly for general statistical purposes. However, it probably will not take more time to execute than some broader base and is acceptable. It is believed that the rating of photography using the 15-section breakdown should be performed by joint teams, preferably at NPIC. Furthermore, there should be as much continuity in these teams as possible. Utilization of NPIC teams for this purpose would provide timely preparation of data and might make the final product generally more acceptable throughout the Intelligence Community.

Qualitative Mission Coverage Index - Type II (Target Areas)

5. The utility of the Type II coverage as proposed herein is questionable. Apparently it was intended to have a target area represented by one quality term or symbol. This is believed generally impractical as the photographic quality and cloud cover may vary over a large area. NPIC would not be interested in attempting to get a single quality definition of these target areas for the purpose of the QMCI. If ratings are to be placed on individual target areas, it would appear that these should result from special studies or activities such as that now underway by the COMAIC Deployment Working Committee.

6. However, NPIC would be interested, as the program develops, in determining whether the inputs for Type I can be utilized to provide a statistical base for Type II. Assuming this could be done, this would mean that for a large target area, the computer could print out the percentage of this target area covered by photography of varying degrees of quality. The usefulness or validity of these statistics is believed to be somewhat uncertain until it is actually tested on the computer. For one thing, errors in geographic location of the frames could cause considerable variations in statistics for a target area 100 miles on the side.

Inclosure 1
TCS-10298-61-KH

Unified Photo Interpretation Report (UPIR)

7. It is understood why the Air Force considers the UPIR of value for its own purposes. However, its value to NPIC is uncertain until we are more familiar with the mechanics of its utilization. NPIC action on this item should await further review.

Fictitious Cumulative Mission Summary (Missions 9009 to 9022)

8. The column headed USSR is believed to provide a useful type of data, provided the definitions of excellent, good and poor are modified as suggested earlier and provided "cloud readibility" is expanded to show percentage of cloud cover. For "point" targets a column such as column 3 in this tabulation (Significant Targets and COMOR) may be useful, but it will have to be prepared by hand analysis because it is believed that the computer cannot locate frames sufficiently accurately to avoid error. For deployment "areas" as opposed to "points" it is believed that an individual area for the most part cannot be treated as an entity with only one qualitative definition. Instead the areas will all have to be combined and the percentages of the various types of photography within these areas will have to be reflected.

INCLOSURE 2

## PROPOSED QUALITY DEFINITIONS

| | |
|---|---|
| Category 1 (Poor) | Image of such low definition that targets cannot be distinguished or identified within any reasonable degree (75%) of certainty. Corners and edges are not sharp, contrast is either low or very high, image will not stand magnification beyond about 15X, poor exposure, low sun angle. |
| Category 2 (Fair) | Image of sufficient definition as to ensure a high (90%) confidence level that targets can be distinguished and in many cases major features identified. Corners and edges are visible but not necessarily sharp, contrast is not extremely high or low, image will stand 20X magnification, satisfactory exposure and light conditions. |
| Category 3* (Good) | Image of such clear definition that it is virtually certain that targets can be distinguished and major features readily identified. Corners and edges are sharp, contrast is represented by a fuller range of densities, image will stand 30X magnification or greater, proper exposure, optimum light conditions. |

| | |
|---|---|
| Distinguished | Recognized; discerned; separated into classes, kinds or categories |
| Identified | Establish the identity of; ascertain to be the same as some known type or description; to specifically name |
| Definition | Distinctness or clarity of detail and outline |
| Targets | 100 feet or more in diameter or least dimension such as ICBM launch pads of the Yurya type, aircraft, ships, industrial complexes, and RR yards. |
| Major features | Larger distinguishing features such as launch pads, road pattern, straight vs swept wing, main buildings, fuel storage tanks, railroad cars, etc. |

* It is anticipated that future collection systems will provide photography of higher quality; hence this must be considered as only an interim upper limit.